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Neu eingegangene Arbeiteu

J. Pelzl, P. Abt, and S. Hüfner, Fachbereich Physik, Freie Universität Berlin:

Zero Point Shift in Rare Earth Doped CaF_2

The line position of the $4f^7(^8S_{7/2}) \rightarrow 4f^6\,5d$ (4130 Å) transition in Eu:CaF_2 has been measured as well as its shift under the action of uniaxial stress. These data are used to estimate the isotope shift due to the zero point vibrations. There is reasonable agreement with that measured directly in Sm:CaF_2.

R. E. Nettleton, Sandia Laboratories Albuquerque, New Mexico 87115:

Interaction between Proton Tunneling and Optical Phonons in KH_2PO_4

The atomic motions which determine spontaneous polarization P_s in clamped KH_2PO_4 or KD_2PO_4 are assumed to be tunneling of protons between minima of a double-well H-bond potential, coupled to phonons belonging to the lowest transverse optic branch. The configuration Hamiltonian H_p of the protons is written in Ising spin representation, and mixed spin-phonon energies are obtained by using the linearized equation-of-motion method, the lowest of these energies diminishing as $T \rightarrow T_c-$ in agreement with Raman measurements. The mixed mode energies depend on $\langle Z \rangle$, the degree of proton order. By differentiating the self-consistent equation for $\langle Z \rangle$, one can show $dP_s/dT \rightarrow -\infty$ at a point T_c where $P_s > 0$, so that the transition is first order. T_c thus identified can be expanded in powers of Γ, and it is found that if the expansion converges rapidly, the spin-phonon coupling should diminish the isotope effect on T_c and contribute positively to the Γ-dependence of P_s at 0° K.

K.-P. Bohnen and K. Fischer, Institut für Festkörperforschung der Kernforschungsanlage Jülich and Institut Max von Laue–Paul Langevin, Grenoble/France:

Influence of Non Magnetic Impurities on the Kondo Effect

The influence of non magnetic impurities on the specific heat, resistivity, and thermopower of dilute magnetic alloys is investigated in the frame of the Suhl-Nagaoka theory. It is found that the various Kondo anomalies are only little changed for pairs consisting of a magnetic and a non magnetic impurity a distance $R > 3k_F^{-1}$ apart compared to single magnetic impurities, where k_F is the Fermi wave vector.

W. Dieterich and P. Fulde, Institut Max von Laue-Paul Langevin, **8046** Garching, Germany:

Martensitic Phase Transitions in Strong Magnetic Fields

The model of linear chains is used to study the lattice softening of A 15-compounds in strong magnetic fields. It is shown that a strong field stabilizes the cubic phase due to the Zeeman energy of the conduction electrons. Experiments are suggested to test our theoretical findings.

W. Weidlich, Institut für Theoretische Physik der Universität Stuttgart:
Fluctuation-Dissipation Theorem for a Class of Stationary Open Systems

A generalised fluctuation-dissipation theorem is proved in the frame of a Liouville-space formalism for stationary open systems in contact with reservoirs, which may be far from thermal equilibrium. It is shown, however, that the wellknown case of thermal equilibrium is included in the result.

F. Schlögl, Institut für Theoretische Physik der Rheinisch-Westfälischen Technischen Hochschule Aachen:
On Thermodynamics near a Steady State

The statistical deduction of a stability criterion for steady states (a generalization of the Glansdorff Prigogine criterion) given in a previous paper is extended in some respects. Dynamical coefficients for the motion of small deviations from a steady state are expressed by correlation functions. The stability critertion is applied to some models of chemical reactions and to a model for second break-down in semiconductors.

I. Licea, Faculty of Physics, University of Bucharest, Rumania:
Hot Electron Transverse Conductivity in Quantizing Magnetic Fields

In this work the general expression of the electron transverse conductivity tensor of an electron-phonon system being in crossed strong electric and quantizing magnetic fields is considered starting from the Kubo-Kalashnikov formula. An explicit formula for the hot electron transverse conductivity σ_{xx} is obtained and it is compared to a Titeica-type formula with the temperature of electrons replaced by an effective electron temperature depending on the electric field.

K. Ueta and K. Hara, Institut für Theoretische Physik, Universität Heidelberg:
Derivation of an Optical Potential for Deuterons

An optical potential for deuterons is derived starting from the nucleon optical potential, taking the deuteron break-up process into account in an approximate way. Numerical calculations have been done for ^{58}Ni(11.8 MeV) and ^{90}Zr(11.8 and 21.4 MeV). The results show that such a process is not at all negligible.

Kurt Emrich, Institut für Theoretische Physik, Technische Universität Hannover:
Theory of Deuteron Stripping on Doubly Even Nuclei

Using the method of quantum Green functions we derive a rigorous formula for the deuteron stripping on a doubly even nucleus. Starting from this formula we discuss the distorted-wave Born approximation, some additional assumptions usually made in numerical calculations and the high-energy case. In addition to this we show that the formfactor can be calculated using a model for the nucleon self energy.

D. Riegel and G. Weyer, Guest group of the I. Physikalisches Institut der Freien Universität Berlin at the Hahn-Meitner-Institut für Kernforschung, Sektor Kernphysik, Berlin-West, Germany:
Nuclear Larmor Precession of the 14 keV State of ^{57}Fe in α-Iron following the Reaction ^{56}Fe $(d, p)^{57}$Fe

The spin precession of the 14 keV state of ^{57}Fe, excited by the ^{56}Fe(d, p) reaction was observed in ferromagnetic Fe. The data yield a magnetic field of -330 ± 4 kG and a relaxation time $\tau_R > 500$ ns at room temperature.

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